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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/532,560

04/25/2005

Philippe Lescoche

71247-0038

4389

22902

7590

05/10/2011

CLARK & BRODY

1700 Diagonal Road, Suite 510

Alexandria, VA 22314

EXAMINER

MELLON, DAVID C

ART UNIT

PAPER NUMBER

1777

MAIL DATE

DELIVERY MODE

05/10/2011

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/532,560	Applicant(s) LESCOCHE, PHILIPPE	
	Examiner DAVID C. MELLON	Art Unit 1777	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 March 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-17 is/are pending in the application.
- 4a) Of the above claim(s) 10-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/10/2011 has been entered.

Response to Amendment

2. The Declaration under 37 CFR 1.132 filed 3/10/2011 has been fully considered. However, it will not be addressed in full detail as the Examiner is entering a new ground of rejection.

Response to Arguments

3. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

The Examiner notes that the pore filled area of Garcera would act as a filter regardless of any other intended function. Furthermore, the support would act as a filter. Furthermore, the pore filled zone of Garcera modified or not would **always** provide some separation effect. It may not be the effect Applicant desires, but particles of sufficient size in a fluid would be captured by the support of Garcera. Remarks that Garcera (either declaratory or arguments) does not provide filter effect by the support are incorrect. Further, Applicant is claiming an apparatus, not the function or method.

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Thus material treated or capable of being treated is irrelevant. Further, in Garcera, there is **no evidence** that the modified support cannot be modified from the interior. Additionally, it has not been shown by Applicant that modifying the Garcera support by swapping the direction the pore filling is provided destroys the function of Garcera nor is there any express teaching found in Garcera to support an argument of teaching away.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1-4 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mott (USP 4,186,100) and in view of Garcera (USP 6,375,014).

Mott discloses a membrane for tangential filtration of a fluid (title/abstract) in figures 1-4 comprising:

A porous support (10) having an inner surface (for example surface 36 beneath layer 66 in figure 3, also see interior in figure 4) and

At least one separator layer coated on the inner surface of the porous support defining a flow channel for fluid to be treated having an inlet and an outlet and the permeate passes through the layer and support (66, see also C5/L25-45 - adapted for RO adding layer 66 to upstream surface 36)

Wherein the porous support has partial pore filling using inorganic particles (e.g. nickel - C4/L9) beginning at the inner surface and in contact with the separator layer (C3/L64-C4/L25).

Mott is silent as to the partial pore filling being variable to provide a mean porosity gradient in the flow direction.

Garcera et al. discloses a membrane with an increasing mean porosity in the direction of flow (Abstract) in figure 1 comprising:

- A porous support (1), delimiting at least one flow channel for fluid to be treated (2) flowing in a given direction between an inlet and an outlet (see in figure 1 arrows indicating direction of flow)
- Having variable partial-pore filling (C5/L50-65 – impregnation) on a portion of the support of a constant thickness creating a mean porosity gradient in the direction of the flow of fluid (Abstract, see section 3 in figure 1, “region impregnated”, C4/L35-41), the minimum porosity being located at the inlet and the maximum porosity at the outlet (C4/L23-35 – see also figure 1, decreasing amount of impregnation from inlet to outlet)
- Partial pore filling using inorganic particles (C6/L15-30 - ceramic particles)
- A separating layer (C2/L55-60, C1/L1-25, C4/L1-10) coated on the inner surface of the porous support (see C1/L4-15)

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the membrane of Mott by modifying the partial pore filling by providing a variable partial pore filling as taught by Garcera to provide a permeability gradient in the direction of flow of fluid to be treated (C2/L34-36 - Garcera) and addresses the concern of transmembrane pressure changes through the tubular channel (c1/L25-45 - Garcera).

Regarding claim 2, modified Mott discloses all of the claim limitations as set forth above. Furthermore, Mott as modified by Garcera et al. inherently discloses a flux density gradient per unit of pressure with the minimum flux at the inlet and the maximum at the outlet since the porosity is lowest at the inlet and highest at the outlet.

Regarding claim 3, modified Mott discloses all of the claim limitations as set forth above. Mott as modified by Childs further discloses that the mean porosity of the support increases inside the support in a transverse direction to the direction of the flow of fluid between the inside surface and the outer surface (see figure 1 of Garcera et al. and further figure 4 of Mott).

Regarding claim 4, modified Mott discloses all of the claim limitations as set forth above. Mott modified with Garcera. further discloses that the variable partial-pore filling is made over a depth from the inner surface which decreases in the direction of flow (see figure 1 in Garcera et al. along with figure 4 of Mott combined as such to create the partial-pore filling from the inside to the outside and a decreasing penetration depth in the direction of the fluid flow).

Regarding claim 6, modified Mott discloses all of the claim limitations as set forth above. Mott further discloses that the pore filling is obtained by penetration from the inner surface of support using inorganic particles smaller than the mean pore diameter of the support (C4/L5-25). Garcera et al further discloses that the partial pore-filling is obtained by penetration of the support with inorganic particles whose mean diameter is smaller than the mean pore diameter of the support (C6/L15-20 - 0.1-4 micron particles,

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C8/L10-21 - 12 micrometer initial pore diameter, C6/L5-10 - "inorganic" impregnation material).

Regarding claim 7, modified Mott discloses all of the claim limitations as set forth above. Garcera et al. further discloses that the penetration of inorganic particles is followed by sintering (C5/L64-C6/L5). Mott also further discloses that the inorganic particles are further modified using sintering (C4/L33-65).

Regarding claim 8, modified Mott discloses all of the claim limitations as set forth above. Mott as modified by Garcera further discloses a mean porosity which increases in a substantially continuous manner in the direction of the flow of fluid to be treated to obtain a substantially constant permeate flow along the flow channel (see figure 1 of Garcera et al., C5/L30--52).

6. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mott (USP 4,186,100) in view of Garcera et al. (USP 6,375,014), and further in view of Grangeon et al. (USP 6,499,606) with French foreign priority date of 8/4/1999.

Regarding claim 9, modified Mott discloses all of the claim limitations as set forth above. Mott does not explicitly disclose the use of mean porosity plateaus in the direction of flow, with the length of the plateaus being substantially identical.

Grangeon et al. discloses a cross-flow filter membrane (title) comprising a porous support and a separator layer (abstract) in figures 1-3. The membrane has an inorganic porous support (2) with a separator layer (4). Grangeon et al. in figure 3 discloses a thickness gradient in the separator layer that diminishes in steps P in the flow direction of the fluid to be treated (C4/L35-45) which are of substantially the same length.

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It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the mean porosity gradient of Mott as previously modified by Garcera such that it is stepwise using plateaus as taught by the separator layer of Grangeon et al. for the purpose of having areas of known mean porosity at constant levels rather than potentially variable continuous zones.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID C. MELLON whose telephone number is (571)270-7074. The examiner can normally be reached on Monday through Thursday 9:00am-5:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on (571) 272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tony G Soohoo/
Primary Examiner, Art Unit 1774

/D. C. M./
Examiner, Art Unit 1777